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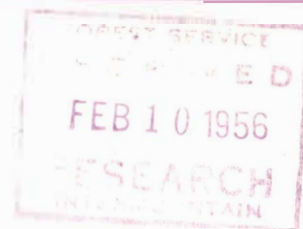
Northeastern Forest Experiment Station

Upper Darby, Pennsylvania
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INTERMOUNTAIN STATION

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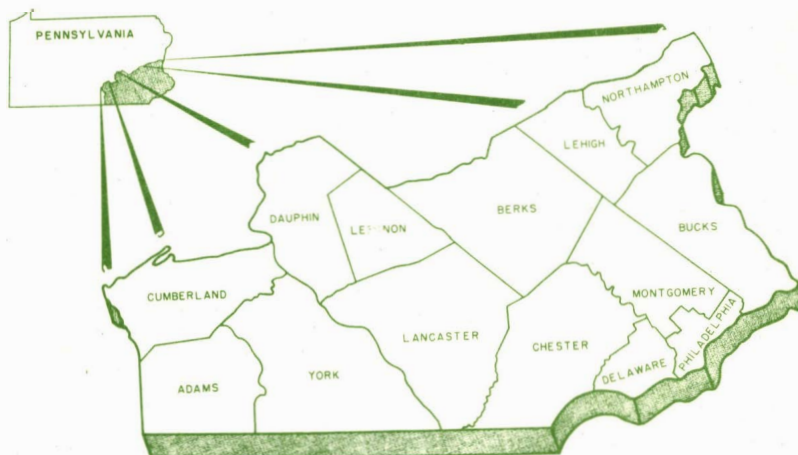
No. 073



Forest Statistics

for the

Southeastern Section of Pennsylvania



Forest Statistics Series

Pennsylvania No. 3

1955

FOREWORD

This is the third in a new series of reports about forest areas and timber volumes in Pennsylvania. It is a product of the Forest Survey of the Northeast, carried on by the Northeastern Forest Experiment Station as part of the nationwide survey being made by the Forest Service, U. S. Department of Agriculture.

The Pennsylvania State Planning Board provided the aerial photographs used in the survey. The Pennsylvania Department of Forests and Waters provided office space and gave other valuable assistance.

Field work in the Southeastern Section of Pennsylvania was supervised by N. B. Griswold. The statistical procedures used were developed by C. Allen Bickford. Computations were made under the supervision of Roland H. Ferguson.

Ralph W. Marquis

RALPH W. MARQUIS
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Forest Statistics for the Southeastern Section of Pennsylvania

Prepared By The

DIVISION OF FOREST ECONOMICS

*Northeastern Forest Experiment Station
Forest Service, U.S. Dept. Agriculture*

GENERAL

A MAP OF PENNSYLVANIA, dated January 1, 1730, shows only four organized counties: Bucks, Philadelphia, Chester, and Lancaster. These original counties covered most of the area of the fourteen counties included in this report, bounded on the east by the Delaware River, on the south by the Maryland and Delaware state lines, and on the northwest by the ridge top of Blue Mountain.

With the metropolitan county of Philadelphia as a hub, main highways radiate throughout this Section. Clustered about Philadelphia are Bucks, Montgomery, Delaware, and Chester Counties. On a perimeter beginning about 40 miles from the heart of Philadelphia are Northampton, Lehigh, Berks, Lancaster, and York Counties. Beyond these and extending into the mountains are Lebanon, Dauphin, Cumberland, and Adams Counties.

Almost all of this Section lies in the Piedmont Plateau. Parts of Dauphin and Cumberland Counties are in the Appalachian Highlands, and a narrow, level area along the

Delaware River is in the Coastal Plain. The land in the Piedmont Plateau consists of rolling plains, rough uplands, and low hills, with irregular ridges and very fertile valleys. This is the main agricultural area of Pennsylvania.

About 45 percent of this section is drained by the Delaware and Schuylkill Rivers. Most of the remainder is drained by the Susquehanna River. A small portion, in Adams County, is drained by the Monocacy River.¹

This section is rich in history. Among its historic shrines are Independence Hall in Philadelphia, Valley Forge in Montgomery County, and Gettysburg Battlefield in Adams County. It is rich in industry. Philadelphia, called "The Workshop of the World," is a great port, ranking second in the United States in the tonnage handled; mills in the Lehigh Valley produce one-third of all cement made in the United States; Bethlehem and Fairless Hills are two of the largest steel-making cities in the world, homes of the Bethlehem and U. S. Steel Corporations. It is rich in agriculture. Lancaster County, called "America's Garden Spot," is the wealthiest county in the United States in the value of its products per acre; and York County is also one of the richest farming districts in the United States.

But it is no longer rich in its timber resource. For it is only 27 percent forested, and less than a third of this is in sawtimber stands.

Forest Area

The total land area in the Southeastern Section is nearly 5 million acres. Only 1.3 million acres are forest land.

Of the forest land, some 20,000 acres are reserved from commercial timber cutting. About half of this (9,400 acres) is in State Forest parks. The remainder is distributed among historical monuments and parks.

Only two counties, Adams and Dauphin, have more than 40 percent of their total land area in commercial forests. Five other counties--Berks, Bucks, Chester, Cumberland, and York--have more than 100,000 acres each of commercial forest

¹For additional information about this area see: Rettie, James C., Doverspike, George E., and Banks, Wayne G. 'Forest Resources of the Monocacy River Watershed of Maryland and Pennsylvania.' U.S. Forest Serv. Northeast. Forest Expt. Sta., Sta. Paper 40. 29 pp., illus. 1951.

land. Two of the smallest counties--Delaware and Philadelphia--contain only $1\frac{1}{2}$ percent of the total commercial forest-land area in this Section.

Ownership

About 87 percent of the commercial forest land in the Southeastern Section is privately owned. One-third of this is owned by farmers and two-thirds by private nonfarm owners.

The remaining 13 percent (164,800 acres) is in public ownership. More than three-fourths of this is owned by the State. Most of the State ownership is in the State Forest lands in Cumberland and Adams Counties and in the State Game Lands in Dauphin and Lebanon Counties. Commercial forest land owned by other public agencies, principally the U. S. Army, amounts to 14,400 acres in Lebanon and Dauphin Counties, and 3,000 acres in five other counties. An additional 21,400 acres is owned by towns and cities, mainly in Dauphin, Berks, and Lebanon Counties.

Forest Types

More than three-fourths of the commercial forest land in this Section carries some kind of an oak forest type. The red oak type is found throughout all counties and occupies 58 percent of the forest area. Chestnut oak is the next most extensive type, occupying 13 percent of the forest area. This type is found generally on the dry, rocky sites above 900 feet in elevation. However, in Chester County some pure stands of chestnut oak are found at an elevation of only 400 feet.

The yellow-poplar forest type, found principally in Chester, Lancaster, and York Counties, occupies 6 percent of the forest area. The ash-elm-maple type, found on moist sites in the shallow drainages of small streams, occupies about 5 percent. Other hardwood forest types account for 9 percent.

Softwoods predominate on about 9 percent of the forest land. Almost half of this is in the eastern redcedar type. In the northern part of Bucks County, pure stands of redcedar have taken over large acreages of old abandoned fields. Twenty-two percent of the forest land in Bucks County is in this type. There is, however, very little timber volume in the eastern redcedar type. Hard-pine forest types account for most of the remaining area in softwood types.

Forest Stands

Sawtimber stands occupy 30 percent of the commercial forest land. The medium and heavy sawtimber stands (5,000 or more board feet per acre) make up only one-fifth of this. Poletimber stands occupy one-third of the forest area. The remaining 37 percent is in seedling-and-sapling stands and nonstocked areas.

Timber Volume

Growing stock in the Southeastern Section of Pennsylvania amounts to slightly more than 900 million cubic feet. Of this, 525 million are in sawtimber trees and 397 million are in poletimber trees. In the three main species groups² there are 75 million cubic feet in the softwood species, 184 million in the "soft" hardwood species, and 663 million in the "hard" hardwood species.

Included in this growing stock are 2,244 million board feet (log scale, International $\frac{1}{4}$ -inch rule) of sawtimber. The oak species, principally northern red oak, make up 55 percent of this total. Yellow-poplar makes up 14 percent and other hardwoods account for 22 percent. The remaining 9 percent of sawtimber volume is in the softwood species, principally pitch pine.

Pulpwood Volume

According to pulpwood specifications developed by the Northeastern and Appalachian Technical Committees of the American Pulpwood Association, practically all of the growing stock is suitable for use by the pulp industry--including some large sawlogs and veneer-log material. In terms of these specifications, there are 11 million rough standard cords of pulpwood bolts.

Hardwood species account for 92 percent of the total pulpwood volume. Almost 22 percent of this is in the soft hardwood species--principally yellow-poplar and red maple. A little more than half of the softwood pulpwood volume is in the hard pines--pitch pine and Virginia pine.

Pulpwood stands averaging better than 5 cords per acre cover nearly 60 percent of the commercial forest land, but pulpwood stands of better than 15 cords per acre cover only 22 percent of the area. The remaining 40 percent of

²See Appendix for list of tree species in each group.

the forest area is made up of land that has no pulpwood volume and other areas where pulpwood volume ranges up to 5 cords per acre.

SOUTHEASTERN SECTION OF PENNSYLVANIA

Table 1.--Land area by major classes, 1951

Class of land ¹	Area	
	Acres	Percent
Forest land:		
Commercial	1,298,200	27
Noncommercial ²	20,400	(2/)
All forest land	1,318,600	27
Nonforest land	3,538,400	73
All land ⁴	4,857,000	100

¹See Appendix for definitions.

²Includes 10,900 acres in State forest parks and historical monuments and 7,100 acres in municipal watersheds reserved from timber cutting.

³Less than 1 percent.

⁴Census of Agriculture, 1950. Water areas of 1 to 40 acres are included in the estimate of nonforest acreage.

Table 2.--Land area and commercial forest-
land area by county, 1951

County	Land area	Commercial forest-land area	
	Acres	Acres	Percent
Adams	336,600	146,200	43
Berks	553,000	175,500	32
Bucks	394,900	111,900	28
Chester	486,400	116,700	24
Cumberland	355,200	109,700	31
Dauphin	332,800	154,600	46
Delaware	118,400	9,300	8
Lancaster	604,800	91,700	15
Lebanon	232,300	67,300	29
Lehigh	222,100	57,300	26
Montgomery	314,900	62,000	20
Northampton	239,400	49,600	21
Philadelphia	81,300	9,300	11
York	584,900	137,100	23
All	4,857,000	1,298,200	27

SOUTHEASTERN SECTION OF PENNSYLVANIA

Table 3.--Commercial forest-land area
by ownership, 1951

Ownership class	Acreage held	
	Acres	Percent
Private:		
Farm forest land ¹	379,900	29
Other private	753,500	58
Total private	1,133,400	87
Public: ²		
State	126,000	10
Municipal	21,400	2
Federal ³	14,400	1
County	3,000	(4/)
Total public	164,800	13
All ownerships	1,298,200	100

¹Census of Agriculture, 1950.

²Includes 68,300 acres administered by the Pennsylvania State Game Commission and 56,400 acres administered by the Department of Forests and Waters.

³All but 400 acres is administered by the U.S. Army at Indiantown Gap.

⁴Less than 1 percent.

Table 4.--Commercial forest-land area
by forest type, 1951

Forest type	Area	
	Acres	Percent
Eastern redcedar	47,400	4
Pitch pine-Virginia pine	22,400	2
Hard pine-oak	23,400	2
White pine types	16,000	1
Red oak	762,600	58
Chestnut oak	175,600	13
Yellow-poplar	77,900	6
Ash-elm-maple	59,300	5
Sugar maple-beech-yellow birch	37,300	3
White oak	37,100	3
Scrub oak	14,100	1
Other hardwood types	25,100	2
All types	1,298,200	100

SOUTHEASTERN SECTION OF PENNSYLVANIA

Table 5.--Commercial forest-land area by forest type group
and stand-size class, 1951

Forest-type group	Saw- timber stands	Pole- timber stands	Seedling-and- sapling stands and other areas	Total area
	<u>Acres</u>	<u>Acres</u>	<u>Acres</u>	<u>Acres</u>
Softwood types	14,500	43,100	51,600	109,200
Red oak	233,400	257,500	271,700	762,600
Chestnut oak	53,000	79,800	42,800	175,600
Yellow-poplar	47,900	11,300	18,700	77,900
Ash-elm-maple ¹	9,800	9,500	55,800	75,100
Other hardwood types	34,600	22,900	40,300	97,800
All types	393,200	424,100	480,900	1,298,200
Percent	30	33	37	100

¹Includes the river birch-sycamore and bottomland hardwood forest types.

Table 6.--Commercial forest-land area by stand-size class
and drainage area, 1951

Stand-size class	Drainage area		Total
	Delaware River	Susquehanna River ¹	
	<u>Acres</u>	<u>Acres</u>	<u>Acres</u>
Sawtimber stands:			
More than 5,000 Board feet per acre	42,100	40,300	82,400
1,500 to 5,000 board feet per acre	147,300	163,500	310,800
Poletimber stands:			
More than 600 cubic feet per acre	56,900	122,700	179,600
200 to 600 cubic feet per acre	74,600	169,900	244,500
Seedling-and-sapling stands:			
Better stocked ²	120,500	130,900	251,400
Poorly stocked	105,000	66,600	171,600
Nonstocked areas	34,500	23,400	57,900
Total	580,900	717,300	1,298,200
Percent	45	55	100

¹Includes 35,100 acres in the Potomac River drainage area and 15,800 acres in the Upper Chesapeake Bay drainage area.

²40 percent or more.

SOUTHEASTERN SECTION OF PENNSYLVANIA

Table 7.--Net volume of live timber on commercial
forest land by species, 1951

Species	Growing stock ¹	Saw- timber ²	Suitable for pulpwood ³
	Thousand cu.ft.	Thousand bd.ft.	Thousand cords
Pitch pine	28,600	82,000	345
White pine	22,600	69,300	272
Virginia pine	12,600	22,500	152
Hemlock	6,200	24,600	75
Other softwoods	4,900	3,500	59
All softwoods	74,900	201,900	903
Northern red oak	246,600	628,800	2,933
Chestnut oak	137,600	237,800	1,636
Yellow-poplar	95,300	318,600	1,133
White oak	63,800	160,100	759
Red maple	53,400	73,200	635
Black oak	51,800	218,700	616
Hickory	40,800	82,000	485
Sweet birch ⁴	40,300	58,200	479
Ash	34,100	96,400	406
Beech	11,800	47,500	140
Sweetgum	10,700	23,900	127
Basswood	9,700	23,700	115
Other soft hardwoods	15,200	25,100	181
Other hard hardwoods	35,800	47,700	426
All hardwoods	846,900	2,041,700	10,071
All species	921,800	2,243,600	10,974

¹See Appendix for definitions. Growing stock includes pulpwood and sawtimber.

²Log scale, International $\frac{1}{4}$ -inch rule.

³4-foot bolts, including bark.

⁴Includes a small amount of yellow birch.

SOUTHEASTERN SECTION OF PENNSYLVANIA

Table 8.--Net volume of live timber on commercial forest land by diameter class, 1951

Diameter class ¹ (in inches at breast height)	Growing stock	Saw- timber
	<u>Thousand cu.ft.</u>	<u>Thousand bd.ft.</u>
Softwoods:		
6	14,200	--
8	11,600	--
10	9,800	32,700
12	12,300	47,200
14	6,400	26,900
16	5,800	24,600
18	8,300	36,600
20 +	6,500	33,900
All softwoods	74,900	201,900
Hardwoods:		
6	114,400	--
8	124,900	--
10	131,600	--
12	119,900	420,300
14	102,300	427,500
16	103,900	451,300
18	56,500	259,500
20	30,700	151,900
22	18,900	96,100
24	22,600	126,900
26 +	21,200	108,200
All hardwoods	846,900	2,041,700
Total	921,800	2,243,600

¹The midpoint of each 2-inch diameter class is indicated.

Table 9.--Net volume of live timber on commercial forest land by forest type, 1951

Forest type	Growing stock	Saw- timber	Suitable for pulpwood
	<u>Thousand cu.ft.</u>	<u>Thousand bd.ft.</u>	<u>Thousand cords</u>
Hard pine-oak	19,700	53,200	235
White pine types	19,100	39,700	227
Pitch pine-Virginia pine	17,100	37,100	204
Eastern redcedar	6,100	10,600	73
Red oak	556,500	1,332,700	6,625
Chestnut oak	120,900	188,500	1,439
Yellow-poplar	90,500	304,500	1,077
Sugar maple-beech-yellow birch	29,200	82,600	348
White oak	28,600	105,300	340
Ash-elm-maple	12,600	33,600	150
Other hardwood types	21,500	55,800	256
All types	921,800	2,243,600	10,974

SOUTHEASTERN SECTION OF PENNSYLVANIA

Table 10.--Average net volume of live timber per acre
of commercial forest land, by
stand-size class, 1951

Stand-size class (and acreage of each class)	Growing stock	Saw- timber
	<u>Cubic feet</u>	<u>Board feet</u>
Sawtimber stands:		
More than 5,000 bd.ft. per acre (82,400 acres)	2,200	8,600
1,500 to 5,000 bd.ft. per acre (310,800 acres)	1,300	3,500
Poletimber stands:		
More than 600 cu.ft. per acre (179,600 acres)	900	1,300
200 to 600 cu.ft. per acre (244,500 acres)	600	600
Other ¹ (480,900 acres)	100	200
Average, all classes ² (1,298,200 acres)	700	200

¹Includes seedling-and-sapling stands and non-stocked areas.

²Hardwoods constitute 92 percent of the total growing stock or 91 percent of the total sawtimber volume. The average cubic volume of the total commercial forest area is equivalent to 9 cords per acre.

Table 11.--Area and volume by pulpwood volume-per-acre class, 1951

Pulpwood class	Area	Volume
	<u>Thousand acres</u>	<u>Thousand cords</u>
Less than 5 cords per acre	538	816
5 to 15 cords per acre	469	4,479
More than 15 cords per acre	291	5,679
Total	1,298	10,974

A P P E N D I X

DEFINITIONS OF TERMS

Forest Area

Forest-land area.--Includes (a) lands that are at least 10 percent stocked by trees of any size and capable of producing timber or other wood products, or of exerting influence on the climate or on the water regime; (b) land from which the trees described in (a) have been removed to less than 10 percent stocking and which has not been developed for other use; and (c) afforested areas. (Forest tracts of less than 1 acre, isolated strips of timber less than 120 feet wide, and abandoned fields and pastures not yet 10 percent stocked are excluded.)

Commercial forest-land area.--Forest land that is (a) producing, or physically capable of producing, usable crops of wood (usually sawtimber), (b) economically available now or prospectively, and (c) not withdrawn from timber utilization.

Noncommercial forest-land area.--Forest land (a) withdrawn from timber utilization through statute, ordinance, or administrative order but which otherwise qualifies as commercial forest land, and (b) incapable of yielding usable wood products (usually sawtimber) because of adverse site conditions.

Forest Types

Forest types are classified according to the species or species group that accounts for the major portion of the stand in terms of cubic feet in sawtimber and poletimber stands, or the number of stems in seedling-and-sapling stands.

Stand-Size Classes

Sawtimber stands.--Stands with sawtimber trees having a minimum net volume per acre of 1,500 board feet, International $\frac{1}{4}$ -inch rule.

Poletimber stands.--Stands failing to meet the sawtimber stand specification, but at least 10 percent stocked

with poletimber and larger (5.0 inches and larger) trees, and with at least half the minimum stocking in poletimber trees. (Poletimber stands carry at least 200 cubic feet per acre.)

Seedling-and-sapling stands.--Stands not qualifying as either sawtimber or poletimber stands, but having at least 10 percent stocking of trees of commercial species and with at least half the minimum stocking in seedling-and-sapling trees.

Other areas.--Forest-land areas not qualifying as sawtimber, poletimber, or seedling-and-sapling stands. (Includes nonstocked areas.)

Tree Classes

Sawtimber trees.--Trees of commercial species that contain at least one merchantable sawlog as defined by regional practice and that are of the following minimum diameters at breast height (d.b.h.): Softwoods 9.0 inches and hardwoods 11.0 inches. (All butt sawlogs are considered merchantable. Where the butt is defective, upper sawlogs are considered merchantable if they account--in terms of aggregate net volume--for 50 percent or more of the gross volume below the top of the uppermost sawlog. Softwood sawlogs are at least 6.0 inches in diameter inside bark at small end; 8 to 16 feet in length; sound and straight enough to be manufactured into standard lumber. The smaller logs are generally free of surface defects other than small tight knots. Hardwood sawlogs are at least 8.0 inches in diameter inside bark at small end; 8 to 16 feet in length; suitable for sawing into standard lumber, construction timbers, or ties.)

Poletimber trees.--Trees 5.0 inches d.b.h. and larger of commercial species that do not meet the specifications for sawtimber trees but do meet regional specifications of species, soundness, and freedom from defect. (These are the trees that are straight and clear enough to make sawtimber trees eventually.)

Seedling-and-sapling trees.--Trees of commercial species less than 5.0 inches in diameter at breast height.

Cull trees.--Live trees of sawtimber or poletimber size that are unmerchantable for sawlogs now or prospectively because of defect, rot, or species.

Timber Volume

Growing stock.--Net volume, in cubic feet, of live sawtimber trees and live poletimber trees from stump to a minimum 4.0-inch top (of central stem) inside bark.

Live sawtimber volume.--Net volume in board feet, International $\frac{1}{4}$ -inch rule, of live sawtimber trees.

Pulpwood.--Net volume in rough, standard cords (bark included) of growing stock, excluding sound defect as well as unsound defect.

Pulpwood Volume

The pulpwood specifications used in this report are those set up by the Northeastern and Appalachian Technical Committees of the American Pulpwood Association.

Pulpwood trees.--Live trees of commercial species, 5.0 inches d.b.h. and larger, containing at least two contiguous pulpwood bolts and with 50 percent or more of the main stem volume usable for pulp. (A merchantable pulpwood bolt is a section of the main stem of a pulpwood tree, 4 feet long; 4.0 inches or larger inside bark at the small end; free from any indication of rot, charred wood, metal or hollow center; and contiguous to one or more sections meeting these same requirements. Crotches are excluded; sweep or crook in any section shall exclude the bolt if a line from the center of the top cut to the center of the bottom cut passes outside the wood at any point. Most of the sawtimber and poletimber trees are also defined as pulpwood trees.)

Pulpwood volume.--Net volume in standard cords (including bark), of the main stem of pulpwood trees, from the stump to a point where the top breaks up into branches, or to a minimum top diameter of 4.0 inches (inside bark). Deductions are made for all portions of the stem that fail to meet pulpwood bolt requirements.

Pulpwood Stands

Less than 5 cords per acre: Stands with trees 5.0 inches (d.b.h.) and larger that meet pulpwood specifications, and with a net volume per acre of less than 400 cubic feet. (Includes seedling-and-sapling stands and nonstocked areas.)

5 to 15 cords per acre: Stands with trees 5.0 inches (d.b.h.) and larger that meet pulpwood specifications, and with a net volume per acre ranging from 400 to 1,200 cubic feet.

More than 15 cords per acre: Stands with trees 5.0 inches (d.b.h.) and larger that meet pulpwood specifications, and with a net volume per acre of more than 1,200 cubic feet.

FOREST SURVEY METHODS

These forest statistics are based on information gathered from aerial photographs and from sample plots examined on the ground.

First, photo-interpretation plots were marked off on the aerial photographs. These plots were distributed uniformly by mechanical means over photographs of the entire district. Trained photo-interpreters then classified each photo-plot as either forest or nonforest. Forest plots were classified further according to stand-size and forest type.

Field crews inspected some of the photo-plots on the ground. Enough plots were selected at random so as to attain a specified level of statistical accuracy. Species and volume data were collected on these ground plots; and the photo classification of stand size and forest type was verified or--if necessary--changed.

The survey was designed for maximum efficiency in estimating total cubic volume to meet the national standards of accuracy.

ACCURACY OF THE ESTIMATES

The estimates in this report may contain two kinds of error. First, photo-interpreters may make mistakes of judgment and fieldmen may make mistakes in measuring or recording. There is no practical way of finding out just how often such errors occur. But they are kept to a minimum by closely checking all phases of the work.

The second kind of error is associated with sampling procedures. The size of this sampling error can be measured. In the Southeastern Section of Pennsylvania the probabilities are 2 out of 3 that the actual forest area is within ± 5.6 percent of the estimated forest area, that the actual cubic-foot volume is within ± 5.0 percent of the estimated cubic-foot volume, and that the actual board-foot volume is within ± 7.4 percent of the estimated board-foot volume. This does not include any mistakes in measurement or classification.

These percentages show that the area estimates are more accurate than the volume estimates, and that the cubic-

foot estimates are more accurate than the board-foot estimates.

In each of the tables, the total figures are more accurate than the subtotals. The subtotals are more accurate than any of the individual figures. Figures that are small in relation to totals are subject to larger sampling errors.

SPECIES TALLIED

The various commercial tree species tallied in the Southeastern Section of Pennsylvania are listed below. Approved common names³ are shown in parentheses if they differ from the brief name used in the tables. Other tree species may occur in the area, but unless they were tallied on the field plots they were not included in the following list.

Softwoods

Pitch pine	- <u>Pinus rigida</u>
White pine (Eastern white pine)	- <u>Pinus strobus</u>
Virginia pine	- <u>Pinus virginiana</u>
Hemlock (Eastern hemlock)	- <u>Tsuga canadensis</u>
Other softwoods	
(Red spruce)	- <u>Picea rubens</u>
(Eastern redcedar)	- <u>Juniperus virginiana</u>

Soft Hardwoods

Yellow-poplar	- <u>Liriodendron tulipifera</u>
Red maple	- <u>Acer rubrum</u>
Sweetgum	- <u>Liquidambar styraciflua</u>
Basswood (American basswood)	- <u>Tilia americana</u>
Other soft hardwoods	
(Paper birch)	- <u>Betula papyrifera</u>
(Elm)	- <u>Ulmus species</u>
(Quaking aspen)	- <u>Populus tremuloides</u>
(Butternut)	- <u>Juglans cinerea</u>
(American sycamore)	- <u>Platanus occidentalis</u>

Hard Hardwoods

Northern red oak	- <u>Quercus rubra</u>
Chestnut oak	- <u>Quercus prinus</u>
White oak	- <u>Quercus alba</u>

³Little, Elbert L., Jr. Check list of native and naturalized trees of the United States (including Alaska). U.S. Dept. Agr., Agr. Handb. 41. 472 pp. 1953.

Black oak	- <u>Quercus velutina</u>
Hickory	- <u>Carya species</u>
Sweet birch (Sweet birch)	- <u>Betula lenta</u>
(Yellow birch)	- <u>Betula alleghaniensis</u>
Ash	- <u>Fraxinus species</u>
Beech (American beech)	- <u>Fagus grandifolia</u>
Other hard hardwoods	
(Sugar maple)	- <u>Acer saccharum</u>
(Scarlet oak)	- <u>Quercus coccinea</u>
(Pin oak)	- <u>Quercus palustris</u>
(Willow oak)	- <u>Quercus phellos</u>
(Black walnut)	- <u>Juglans nigra</u>
(Black locust)	- <u>Robinia pseudoacacia</u>
